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jc922 U.S. PTO

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PATENT

Attorney Docket No. TRW(ASG)5545

Assistant Commissioner for Patents
Washington, D.C. 20231

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of Inventor(s): **Ralph Frisch**

or (title): **FASTENER FOR SECURING A GAS BAG MODULE TO A STEERING WHEEL**

Enclosed are:

Papers Required for Filing Date Under 37 CFR 1.53(b):

- 5 Pages of specification
- 1 Pages Abstract
- 1 Pages of claims
- 1 Sheets of drawing
- ☒ formal (Figs. -)
- ☐ informal

In addition to the above papers there is also attached:

CERTIFICATION UNDER 37 CFR 1.10

I hereby certify that this New Application Transmittal and the documents referred to as enclosed therein are being deposited with the United States Postal Service on this date September 29, 2000 in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number EK956006423 addressed to the: Assistant Commissioner for Patents, Washington D.C.

Deborah Denn
(Type or print name of person mailing paper)


(Signature of person mailing paper)

2. Declaration or oath:

- ☒ Enclosed (Executed)
☐ Not Enclosed.

3. Language:

- ☒ English
☐ Non-English
☐ A verified English translation of the
☐ specification and claims
☐ declaration

is attached.

Assignment:

- ☒ An assignment of the invention to TRW Automotive Safety Systems GmbH &Co. KG

- ☒ is attached.
☐ will follow

5. Certified Copy:

Certified copy (ies) of application (s)

GERMANY
(Country)

299 20 025.6
(Appln. No.)

15-Nov-99
(Filed)

(Country)

(Appln. No.)

(Filed)

(Country)

(Appln. No.)

(Filed)

from which priority is claimed

- ☒ is attached
☐ will follow

6. **Fee Calculation:**
(Small entity filing fee is 50% normal fee)

CLAIMS AS FILED						
Number Filed	Number Extra		Rate		Basic Fee	
					\$ 690.00	
Total Claims	6	-20 =	-0-	X	\$ 18.00	-0-
Independent Claims	1	-3 =	-0-	X	\$ 78.00	-0-
Multiple dependent claim(s), if any				+	\$260.00	

- ☐ Amendment canceling extra claims enclosed
- ☐ Amendment deleting multiple dependencies enclosed
- ☐ Fee for extra claims is not being paid at this time

Filing Fee Calculation \$690.00

Small Entity Statement

- ☐ Verified statement that this is a filing by a **small entity** under 37 CFR 1.9 and 1.27
(Must be enclosed to get small entity filing fee reduction)

Fee Payment Being Made At This Time:

Enclosed:

- ☒ basic filing fee \$690.00
- ☒ assignment recordal fee \$40.00
- ☐ for processing an application with a specification in a non-English language \$
- Total fees enclosed \$730.00

9. **Method of Payment Fees:**

- ☒ check in the amount of \$ 730.00 enclosed.

☐ The Commissioner is hereby authorized to charge any **DEFICIENCY** in the filing fees for this application to our Deposit Account No. 20-0090.

10. **Instructions As to Overpayment:**

- ☒ refund

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SIGNATURE OF ATTORNEY, REG. NO. 20,177

THOMAS L. TAROLLI
Type or print name of attorney

Fastener for Securing a Gas Bag Module to a Steering Wheel

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Technical Field

The invention relates to a fastener, in particular for securing a gas bag module to a steering wheel, the fastener comprising two fastening arms and a fastener part.

Background of the Invention

Securing the gas bag module, containing the drivers air bag, to a steering wheel needs to satisfy various requirements. For one thing it needs to be rugged enough so that it will under no circumstances become loose during deployment of the gas bag in a restraint situation, but for another, it needs to be releasable for any repair or replacement of the gas bag module needed. Apart from this the time it takes in installing the gas bag module should be a minimum. These requirements can be satisfied by snap-action fasteners in which flexible arms engage protuberances provided on a companion piece. The disadvantage with known snap-action fasteners is that they can only be released with difficulty, or, if easily releasable are not rugged enough.

The object of the invention is to propose a fastener ensuring a safe but readily releasable connection of two components, more particularly of a gas bag module and a steering wheel.

Brief Summary of the Invention

This is achieved in a fastener which comprises two fastening arms and a fastener part. The fastening arms enter into a snap-action connection with the fastener part and clasp the fastener part in a connected condition. Due to the double-sided engagement a firm connection materializes between the

fastening arms and the fastener part. The connection is easily released by pressing apart the arms with a suitable tool, it being of advantage that releasing the connection is non-destructive. Since the fastening arms are pretensioned inwards
5 the risk of the arms being damaged is reduced.

In one preferred embodiment of the invention the fastening arms are provided with hooks having contact surface areas and the fastener part comprises a concave contacting surface area
10 into which the contact surface areas of the hooks engage in the connected condition. This design improves retainment of the hooks on the fastener part. In addition to this the concave contacting surface area of the fastener part serves to guide the contact surface areas of the hooks during release of
15 the connection.

In another preferred embodiment the fastener part and the fastening arms comprise ramps corresponding to each other. These ramps form guides which reduce the loading of the
20 fastening arms on spreading and prevent damage to the snap-action hooks in producing the connection.

Preferably the ramps are configured on the fastener part such that they form an angle and that the fastening arms slide
25 back towards the apex of the angle should the connection fail to be made. This configuration ensures that a component provided with fastening arms, more particularly a gas bag module which to produce the connection is inserted into a component containing the fastener part, more particularly a
30 steering wheel, is urged back should the snap-action connection fail to latch, thus making it easy to recognize faulty assembly. This movement may be supported by a spring.

Advantageously an assembly comprising a steering wheel and
35 a gas bag module is provided, the fastening arms being connected to the gas bag module and the fastener part to the steering wheel in order to improve access to the fastener. Preferably in this arrangement the fastening arms are

configured integrally with the gas bag module, e.g. in the region of the inflator mount or generally a module supporting structure, and the fastener part is configured integrally with the steering wheel, e.g. with its supporting structure. In this way there is achieved a rugged configuration whilst simultaneously reducing the number of components required since the fastener part and the fastening arms, respectively, do not need to be produced as separate elements.

10 Brief Description of the Drawing

The sole Figure shows a section through a fastener in accordance with the invention.

15 Detailed Description of the Preferred Embodiment

Referring now to Fig. 1 there is illustrated a fastener 10 in accordance with the invention which connects a component e.g. the inflator mount 12 of a gas bag module to a fastener part 14 secured e.g. to a steering wheel by a snap-action connection. The fastener 10 comprises two fastening arms 16 preferably made of a plastics material which end in hooks 18. In the connected condition which is shown, the hooks 18 clasp the fastener part 14 in such a manner that the flat or slightly convex upper sides 20 contact a corresponding undercut, preferably concave surface area 22 on the fastener part 14. In this condition the inflator mount 12 is locked in place against tension in the direction of the arrow A away from the steering wheel.

In addition the hooks 18 of the fastening arms 16 comprise ramps 24 at their side facing the fastener part 14. The fastener part 14 comprises corresponding ramps 26. Both the ramps 26 of the fastener part and the ramps 24 of the hooks include angles whose legs run towards each other, as seen in the direction of the arrow A. The ramps 26 of the fastener part are preferably configured with two steps 26', 26". The

first step of the ramps 26' includes a smaller angle than the second step 26".

In making the connection the gas bag module is inserted
 5 contrary to the direction of the arrow A into its mount in the steering wheel and the fastening arms 16, pretensioned inwardly towards the fastener part 14, slide by their ramps 24 along the ramps 26 and are pressed apart so gently that the edges of the hooks 18 cannot be damaged. The less inclined
 10 ramps 26' first permit soft seating and shifting with little effort, whereas in the region of the more inclined ramps 26" a sharp increase in the counterforce materializes. Once the hooks have arrived at the end of the ramps 26" the hooks snap back by the distance spread apart and clasp the fastener part
 15 14.

When the insertion movement of the gas bag module stops before the hooks 18 snap in place in the surface area 22, the fastening arms 16 and thus the gas bag module are urged back,
 20 due to the spring force of the fastening arms 16, contrary to the direction of the arrow A and away from the steering wheel due to the shape of the ramps 26 of the fastener part - but especially due to that of the ramps 26" - and the ramps 24 of the hooks. This movement is assisted by a spring 28 disposed
 25 between the steering wheel and the gas bag module, this spring being pretensioned by the insertion movement. It is thus easy to recognize any failure of the snap-action connection to occur.

30 To release the connection the hooks 18 are pressed apart at their ramps 24 by a suitable tool, e.g. a screwdriver until the contact surface area 22 of the fastener part 14 releases the contact surface areas 20 of the hooks 18, the contact surface area 22 serving here as a guide for the contact
 35 surface areas 20 of the hooks. As soon as the ramps 24 of the hooks 18 are in contact with the ramps 26 of the fastener part, the gas bag module is moved due to the shape of the ramps 24, 26 and the spring force of the fastening arms 16 so

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T 9042 US

Claims

1. A fastener, in particular for securing a gas bag module to a steering wheel, said fastener comprising two fastening arms and a fastener part, said fastening arms entering into a snap-action connection with said fastener part and clasping said fastener part in a connected condition.
2. The fastener as set forth in claim 1, wherein said fastening arms comprise hooks having contact surface areas and said fastener part comprises a concave contact surface area into which said contact surface areas of said hooks engage in said connected condition.
3. The fastener as set forth in claim 1, wherein said fastener part and said fastening arms comprise ramps corresponding to each other.
4. The fastener as set forth in claim 1, wherein said ramps of said fastener part include an angle and said hooks slide back towards the apex of said angle should the connection fail to be made.
5. The fastener as set forth in claim 1, wherein an assembly comprising said steering wheel and said gas bag module is provided, said fastening arms being connected to said gas bag module and said fastener part to said steering wheel.
6. The fastener as set forth in claim 5, wherein said fastening arms are configured integrally with said gas bag module and said fastener part is configured integrally with said steering wheel.

T 9042 US

Abstract

- 5 A fastener, in particular for securing a gas bag module to a steering wheel, comprises two fastening arms and a fastener part. The fastening arms enter into a snap-action connection with the fastener part and clasp the fastener part in a connected condition.

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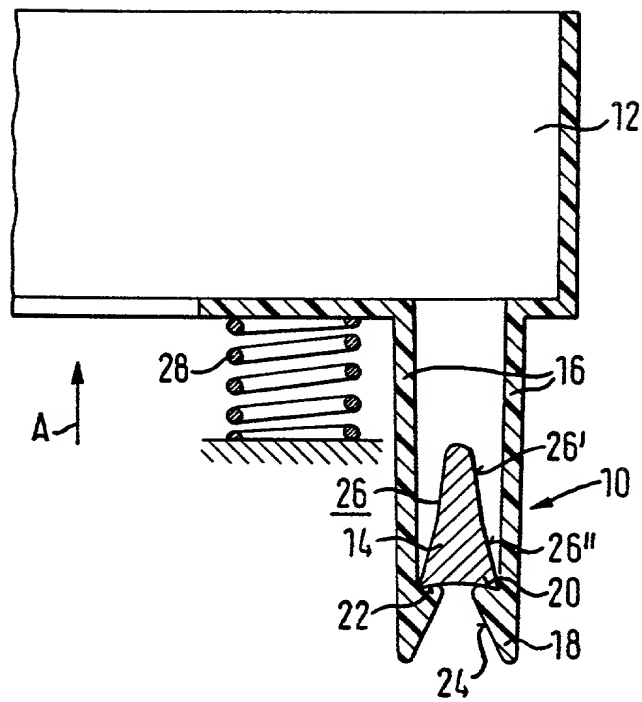
Date of Deposit:

Person Mailing Paper or Fee

Name of Person Signing _____

Date of Signature

FIG. 1



DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

Atty. Docket No. TRW (ASG) 5545

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

" Fastener for Securing a Gas Bag Module to a Steering Wheel
the specification of which:

(check one) ☒ is attached hereto.

☐ was filed on _____ as Application Serial No. _____
and was amended on _____ (if applicable).

☐ was filed on _____ as International Application No. _____
and was amended on _____
by ☐ Preliminary Amendment ☐ Article 19; ☐ Article 34 (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

<u>299 20 025.6</u> (Number)	<u>Fed. Republic of Germany</u> (Country)	<u>15/11/99</u> (Day/Month/Year Filed)	Priority Claimed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/> Yes <input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code §1.12, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status-patented, pending, abandoned)
_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status-patented, pending, abandoned)

Power of Attorney: As a named inventor, I hereby appoint the following attorneys: Thomas L. Tarolli, Reg. No. 20,177; Robert B. Sundheim, Reg. No. 20,127; Calvin G. Covell, Reg. No. 24,042; Barry L. Tummino, Reg. No. 29,709; Paul E. Szabo, Reg. No. 30,429; James L. Tarolli, Reg. No. 36,029; Ronald M. Kachmarik, Reg. No. 34,512; Richard S. Wesorick, Reg. No. 40,871; Maurice R. Salada, Reg. No. 26,502; Allan W. Voge, Reg. No. 28,127; and Gary L. Hermanson, Reg. No. 34,349; each with full powers of substitution and revocation to prosecute this application and transact all business in the United States Patent and Trademark Office connected therewith.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1) Full name of sole or first inventor Ralph FRISCH
Inventor's signature *Ralph Frisch* Date 07.08.2000
Residence 63776 Mömbris Citizenship German
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2) Full name of second inventor _____
Inventor's signature _____ Date _____
Residence _____ Citizenship _____
Post Office Address _____